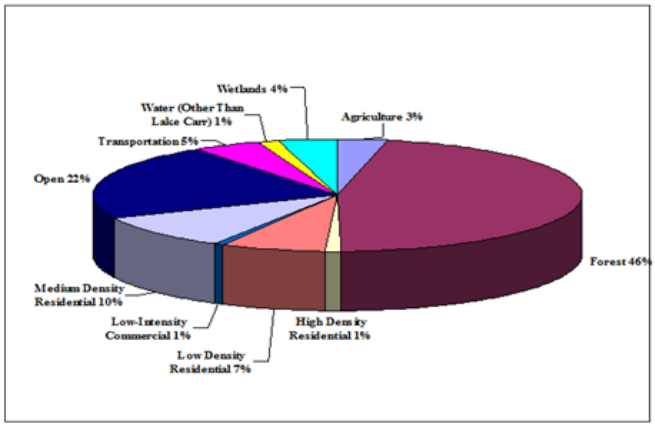
Waterbody: Lake Carr

Basin: Lake Jackson

Lake Carr is an approximately 880 acre, primarily phosphorus-limited, shallow lake located north of Lake Jackson and is essentially surrounded by two property owners: Ayavalla Land Company and Orchard Pond LLC. Lake Carr is a valuable biological, aesthetic and recreational resource of Leon County and was designated as an Aquatic Preserve in 1973 for the primary purpose of preserving and maintaining the biological resources in their natural condition.

As shown in the following pie chart, 27% of land uses in the 4,865 acre Lake Carr watershed are commercial, residential, agricultural, or transportation. The lake receives direct runoff from the surrounding agricultural property as well as flow from the residential areas east of Meridian Road (Summerbrooke and Ox Bottom Manor). Waterbodies in the residential areas are modified farm ponds serving as stormwater facilities dedicated to the respective homeowner's associations for maintenance. The Summerbrooke Golf Club (157 acres) also lies in this watershed. Increases in stormwater runoff, and waterbody nutrient loads can often be attributed to these types of land uses.



Background

Healthy, well-balanced lake communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation. Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff, adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (*e.g.,* recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water, sediment samples and a Lake Vegetation Index Survey (LVI) were collected to determine the health of Lake Carr and met the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The nutrient thresholds and results are found in Table 1. According to FDEP requirements, Numeric Nutrient Criteria (expressed as an annual geometric mean) cannot be exceeded more than once in a three year period. The state criteria were not exceeded. Unfortunately, due to extremely low

water levels and a plethora of aquatic vegetation, staff was unable to launch a boat to collect water quality samples in 2012 and the first quarter of 2013.

Table 1. FDEP's chlorophyll *a*, total nitrogen and phosphorus criteria for lakes applied to Lake Carr.

Clear Lake, Low Alkalinity	Chlorophyll-*a* 6.0 µg/L	Total Nitrogen Threshold 0.51-0.93 mg/L	Total Phosphorus Threshold 0.01-0.03 mg/L
2004	1.3	0.29	0.01
2005	1.4	0.27	0.01
2006	1.1	0.39	0.01
2007	2.2	0.61	0.02
2008	4.6	0.64	0.02
2009	4.8	0.50	0.02
2010	5.5	0.49	0.02
2011	5.2	0.44	0.01
2012-2013	-	-	-

Dissolved Oxygen

As Figure 1 shows, station CA1 percent dissolved oxygen (DO) saturation values did not meet Class III water quality criteria while station CA2 always met the criteria. This was not unexpected, since the CA1 station is a shallow station normally covered with vegetation, which prevents rapid water exchange with the larger area of the lake. Plant respiration (samples were often taken in the morning hours) also contributed to the low DO saturation values. The CA2 station is located in open water so conditions are more optimal for rapid water exchange with the remainder of the lake. Staff believes that this is a natural condition for both locations.

Other Parameters

Other water quality parameters appear to be normal for the area and no impairments were noted.

Floral Assessment

The Lake Vegetation Index (LVI) score for Lake Carr was 69, placing the lake's vegetative community in the healthy category.

Fifty three plant species were found during the survey. The native species, fanwort (*Cabomba caroliniana*), coontail (*Ceratophyllum demersum*), fragrant waterlily (*Nymphaea odorata)* and leafy bladderwort (*Utricularia foliosa*) were the most dominant plants in the lake. Other native shoreline vegetation included; red maple (*Acer rubrum*), buttonbush (*Cephalanthus occidentalis*) and dotted smartweed (*Polygonum punctatum*).

Unfortunately, torpedo grass (*Panicum repens*) and water hyacinth (*Eichhornia crassipes*), both listed as Category I Invasive Exotics by the Florida Exotic Pest Plant Council are invasive exotics that are a concern in Lake Carr. Alligator weed (*Alternanthera philoxeroides*), was the only Category II Invasive Exotic found in the lake.

Click here for more information on the Lake Carr LVI.

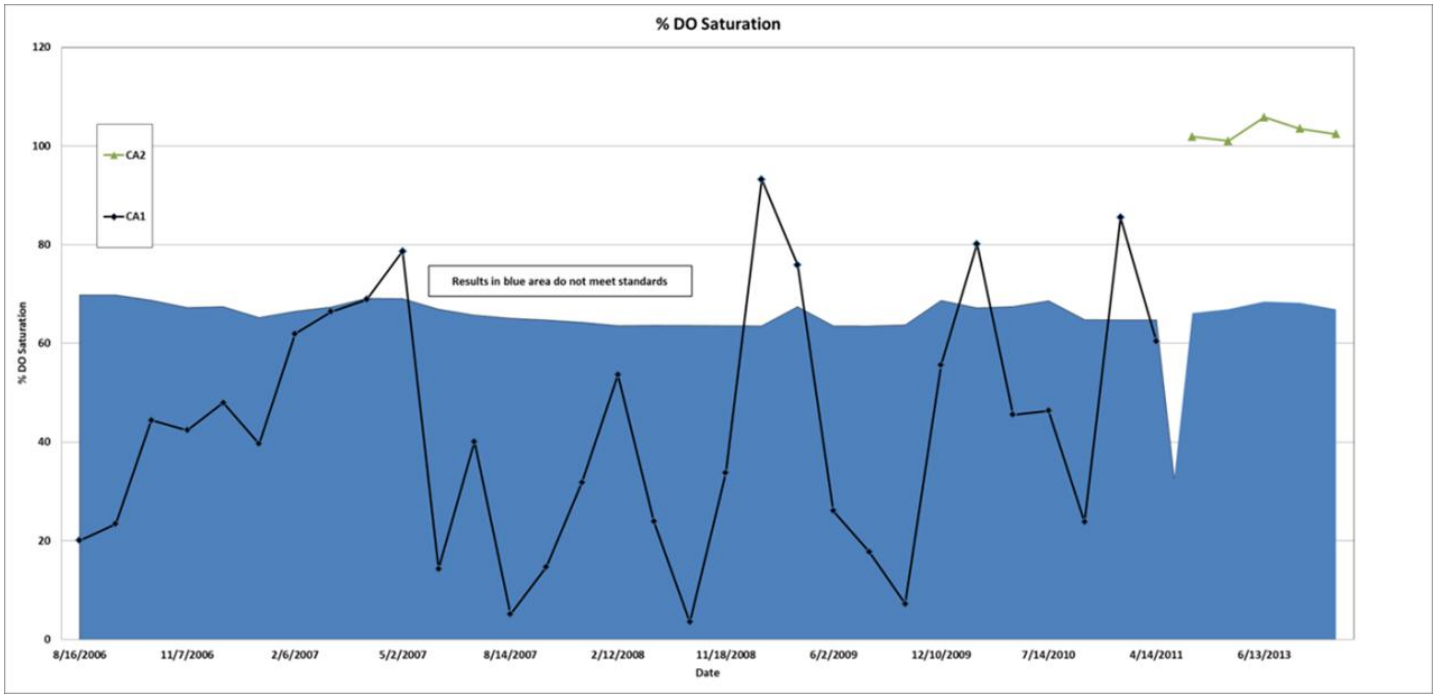


Figure 1. Dissolved Oxygen Percent Saturation results for Lake Carr.

Conclusions

Based on ongoing sampling, Lake Carr met the nutrient thresholds for the East Panhandle region; and the floral community is considered "healthy" by the LVI. Staff considers the low DO results at Station CA1 a natural condition. Other water quality parameters appear to be normal for the area and no impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and resources for more information

www.LeonCountyFL.gov/WaterResources

Click here to access the results for all water quality stations sampled in 2013.

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